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Discussion of various aspects of the architect-client relationship and architectural duties and procedures is presented. The various stages of architect selection precede a discussion of services and fees. The problem solving process is detailed in terms of--(1) client influence, (2) decision making, and (3) preliminary stages. Preparation of construction documents is explained in relationship to--(1) working drawings, (2) specifications, (3) contract documents, (4) economic negotiations, and (5) contractor role. The construction phase section includes review of--(1) administrative duties of the architect, (2) lines of authority, (3) contractual difficulties, and (4) building occupancy. (MH)

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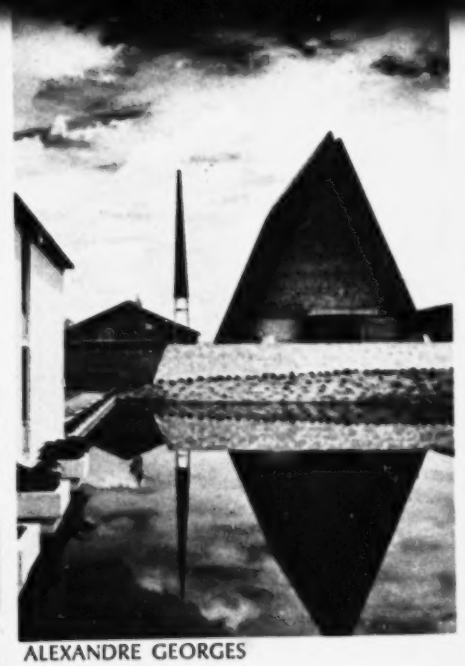

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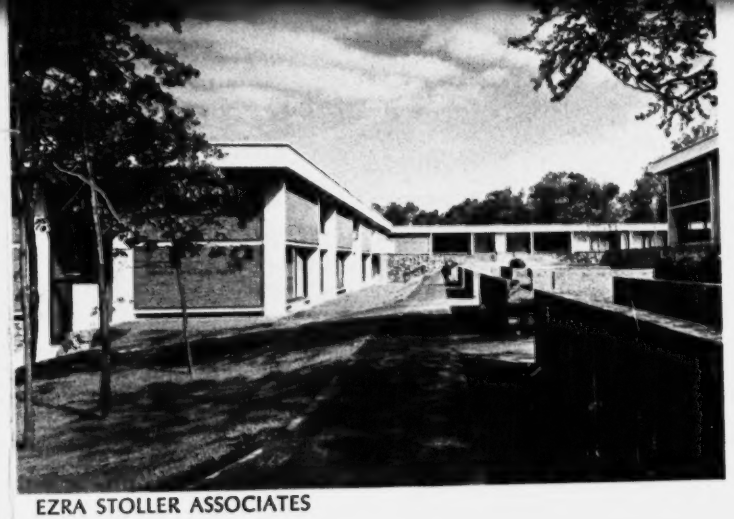

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# your building & your architect

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BY DONALD CANTY

This booklet is an abridgment of a series of articles originally published in *The Architectural Forum* and copyrighted by Urban America, Inc. The author, then senior editor of *Forum*, is now director of Urban Information Center of Urban America, Inc., Washington, D. C., and editor of its magazine *City*.

Mr. Canty is not an architect — he is a journalist with a well-deserved reputation as an objective critic of architects and architecture. The American Institute of Architects has selected his article for the use of prospective building owners because it is an informed nonarchitect's candid view of how our clients' and professions' interests can be best served.

Your goal is ours: the best building for you, architecture of highest quality, and a positive contribution to the community and nation of which it will be a lasting part.

Our profession pledges its every effort to help you attain those goals.

# how to pick an architect

There is no easy way to pick an architect. True, there are some general rules that can be stated, pitfalls that can be warned against, pointers that can be offered about what to look for in an architect and his work — and all of these things are done in the following pages.

But there is no magic formula for selection. "Listen," said a man in charge of building some $10 million in retail stores a year when asked how he does it, "if you come up with a good system, let me know."

In reality, systems and procedures are less important in this perilous quest than is the disposition of the client. To the task he must bring good intentions, an open mind, a hardy sales resistance and a willingness to take the time and trouble to learn something of what architects and architecture are all about.

To some clients, used to making clear-cut decisions about clear-cut problems, all of this seems impossibly hazy and imprecise. They seek an easy way out, turning to acquaintances, to brothers-in-law, to big, briskly businesslike architectural firms, or to the even bigger organizations which offer a neat package of construction services. Sometimes they get fairly good buildings, but they do not often get architecture.

Hence the stress on good intentions. All things being equal, the client gets about as good a building as he wants. To achieve architecture — a building which is soundly put together, which works well and which is an ornament to its surroundings and a source of deep satisfaction to its occupants — the client must have a strong drive to do so. His motivation may be simple pride, public relations, a feeling of responsibility to the community and the building's ultimate users. Whatever the reason, he must actively want the building to be something far more than mere shelter.

And then he must try to select the right architect. Otherwise, the best of intentions are wasted. Many a client who starts out with a desire to be a party to greatness winds up a patron of mediocrity, all through making the wrong choice. Selecting an architect is by no means the only decision the client has to make during the building process, but it is far and away the most crucial.

**Formal competition: it may be worth the trouble**

There does exist one cut-and-dried method of making the choice, which perhaps should be dealt with first. It is the formal architectural competition, held under the code for architectural competitions (AIA Document B451), established by The American Institute of Architects, in which the client hires a professional adviser, sets up a jury and invites architects to submit designs based on a common program.

Architectural competitions are popular sport in Europe, but they have never really caught on in the United States. Indeed, it is not difficult to make a case against them: they can be expensive to stage (the AIA code requires compensation to the professional adviser, the jury and the finalists). They sometimes tend to drive out the busier, better-known firms who simply don't have time to take a flyer. They can deprive the client of the chance to closely investigate the extra-design abilities of the firm that gets the jury's nod.

And yet the formal competition is the nearest thing to a sure-fire system for attaining superior architecture — a system that lets the client see a facsimile of the product before a designer is selected and provides a panel of experts to guide the choice. It is especially well-suited to public projects: it is, after all, a particularly democratic way to pick architects, and it also takes some of the political pressure off the public client. Most important, it often leads to a freshness and excitement not often found in public buildings. There is reason to question, for example, whether Boston would have the prospect of such a vigorous new city hall had the architects been selected and retained directly by the city government.

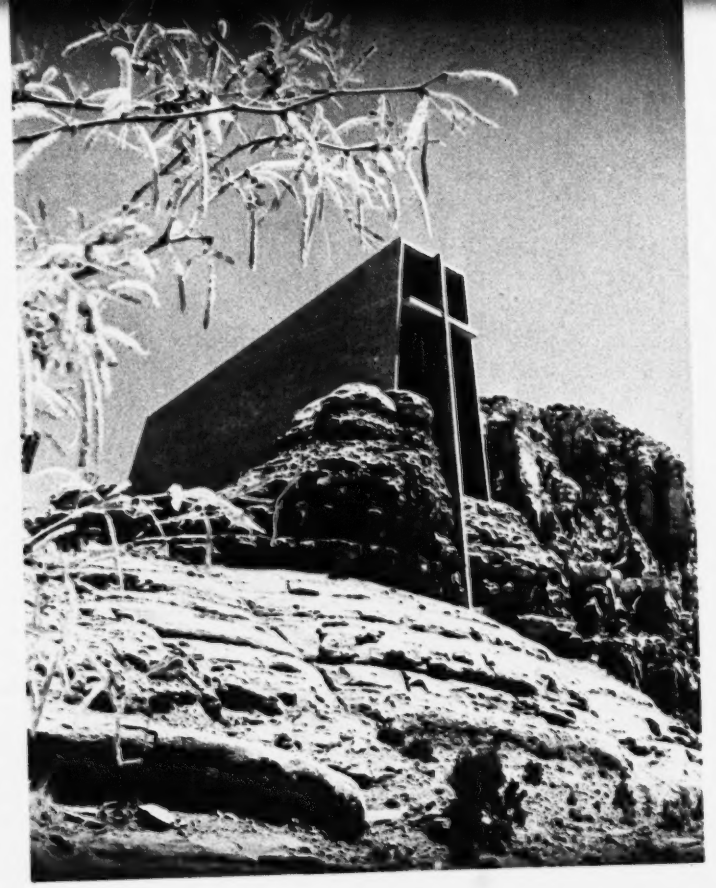
**The first list: where to go from the yellow pages**

For the majority of clients, who don't feel a full-scale competition to be feasible, the search for an architect begins with a list of names. If they are habitual clients or long-time architecture buffs, they probably start with some names in mind. If not, however, they are likely to be seen staring at the yellow pages of the telephone book and wondering where to turn.

Some turn to the local chapter of the AIA, but more often than not come away disappointed. The AIA is a membership organization, and in prudence cannot be expected to make qualitative distinctions among those who pay it dues. Many architects, moreover, stoutly resist classification as specialists, and in some localities the AIA office is forbidden even to suggest architects who have done a great many buildings of one type or another.

The best advice that can be offered the bewildered client at this point is to enter into a crash program of self-education and to pick the brains of all accessible experts shamelessly. Architectural buff or no, if he has the firm intention to achieve a good building, he probably has some standard of what a good building is. The goals of the education program are to develop these standards further and to find some architects who seem to offer promise of meeting them.

One starting point is in the pages of the architectural magazines, which convey a feeling of what is currently being built and may even contain work



by architects in the client's own locale. The AIA chapter may conduct an awards program or have available a guidebook, both of which give some indication (though far from an infallible one) of the practitioners whom the architectural community considers its leaders. But the most instructive procedure of all is for the client to visit new buildings, to get their "feel," and then to find out who designed those to which he responds most positively.

As for the expert counsel, it should be sought on both sides of the fence, among clients as well as architects. Acquaintances or colleagues who have gone through the process of selection recently are rich sources. It is harder on the architects' side: who could summon the nerve to ask Macy's to recommend a good department store? Good prospects here are architect friends who are employees of large offices, architectural journalists and architectural educators. Journalists and educators are often chary about recommendations, however.

**The matters of chauvinism, size and specialization**

The making of the first list of potential candidates involves more than knowledge. It also involves some tough decisions about matters on which even the most expert disagree. Among them, in fact, are perhaps the three most hotly debated questions about the selection of architects.

The first is whether the client should consider only local firms. If he is a staunch member of the Shop at Home Committee of the chamber of commerce, the question may well answer itself. National concerns who want to become "part of the community" also may find it prudent to use only home-grown talent. Local public agencies, notably school boards, often are subject to some rather unsubtle pressures from the architectural fraternity not to look too far afield. And even beyond such considerations, there are good reasons to have the architect close at hand during the design and construction process.

Unhappily, however, some communities are not rich in the kind of talent required to produce superior work. The client who wants a building of genuine quality may be forced to look elsewhere. After all, the desire to give the community such a building is local pride of an admirable sort. The hometown architects should understand; they are professionals, not juvenile gang leaders carving an area into unimpregnable turfs. As for the convenience of having the architect nearby, it can often be attained through an association between the out-of-town architect and a local firm.

The second knotty question involves the project's size. If it is a large and complex job, should only big firms be considered? The big firm, of course, will answer yes. It will claim, with a good deal of justification, to offer a wider range of services than a small office. The big firm will also point out that it takes both manpower and experience to manage the myriad details involved in a sizable project.

These are compelling arguments — *if* the client is satisfied that the big firm will also deliver quality. Some do, but here another harsh fact must be faced: there are enormous architectural offices, turning out enormous quantities of work, which have yet to do a good building. What may be a large job to the client, moreover, may be run-of-the-mill to the big firm and may wind up in the hands of a 22-year old designer in one corner of its huge drafting room.

There are two alternatives. One is to engage a medium-sized firm with a hard core of superior personnel which is willing to expand its production staff for the job. The client must balance the risks involved against the likelihood that the firm will throw all of its talents unstintingly into his building. The other is, again, an association, this time of a small design office with a big firm to handle production and perhaps construction contract administration.

A word about such associations: they are a little like shot-gun weddings, particularly if the two firms have both been contenders for the commission. There should be a precise understanding about who is in charge of what; otherwise, design ideas can be lost in endless bickering and compromise. Also, even though the two firms share the fee, the client should understand that he will be putting out a little more in expenses. Whether the association is worth it is his decision.

The third and final point of controversy is whether the client should seek only those architects who have solid experience in the type of building at hand. Phalanxes of specialists have grown up around those types which are especially complicated in program or function, such as schools, hospitals, laboratories and factories. Often these specialists know the client's problems better than he does. They can make his life a great deal easier.

But sometimes the specialist becomes so steeped in the client's problems that the process of design becomes automatic — and the building looks it. His expertise is not to be dismissed lightly, but it should not be overweighted. Often a fresh solution comes from the application of a fresh talent, even a young talent. A good many outstanding buildings have resulted from the encounter between an imaginative architect and a new problem complex enough to be challenging.

**The interview: the selection process gets personal**

The client now has his preliminary list. It is not too long, and nicely assorted among architects far and near, big and small, experienced and untrammeled. The next step is an entertaining one. He should contact each of the candidates, explain the nature of his project and invite them to submit information on their offices and their past work. The next few days' mail will bring him an amazing variety of missives, ranging from chaste professional communications to thick, multicolor brochures. Care-

ful study, culling fact from fancy, should enable him to further trim the list to those he wants to interview.

"In the end," an *Architectural Forum* editorial once said, "a client has to trust two people: himself and his architect." The interview is generally the first face-to-face encounter between the two. One of its principal functions is to give an indication whether their coming together produces that special chemistry required for joint participation in creative effort. The reaction is indefinable — it is more than a matter of mere compatibility — but it must be real if something of worth is to result from the association.

An important corollary of the statement just quoted is that architecture is, in the final analysis, a personal matter, whose creation is best not left to committees. Until now, we have used the word client in the singular. Something in the nature of modern institutions, however, seems to require the setting up of committees for tasks like choosing architects. It is probably unavoidable, and it can turn out all right if one condition is met: that a single, strong individual on the committee be given prime responsibility for the screening process of voices and ideas that will produce only contradictions, confusion and, in the end, mediocrity.

No two architect-client interviews are quite alike. Some clients like to visit the architect in his natural habitat; some feel safer meeting the architect on their own home grounds. Some architects appear wreathed in smiles and flanked by vice presidents in charge of client development (salesmen); some come alone and sit quietly, willing to let their work speak for them. In the normal course of the interview, the client explains his project in more detail and asks the architect about his office and his experience. The architect attempts to relate his capabilities to what seem to be the client's needs. Somewhere along the line, each forms the important first impression of what the other would be like to work with.

There are, of course, a few general types the client should be warned away from: the architect who shows more interest in the smoothness of his pitch than in the specifics of the job at hand; the architect who claims to have developed startling, cost-cutting innovations; the architect who comes to the interview already bearing a sketch of what the building might look like and, most sinister of all, the architect who hints that he might be able to shave the fee a bit. The AIA chapters put out schedules of recommended fees which have met the tests of fairness to both sides. The architect can suggest that the fees be higher than the schedule if extra services are required, but beware if he offers to make them lower.

The client will not work solely with the architect himself, and so should get to know the others in the office who will be importantly involved in the project (a step which can be accomplished either in the initial interview or as a follow-up). Included here are the structural, mechanical, electrical and acoustical engineers, whether they are on the architect's staff or are to be engaged by him as consultants.

The client is now almost ready to make the choice, but not quite. The final proof of an architect is in his buildings. The client's final step, then, is a careful investigation of each surviving candidate's past work.

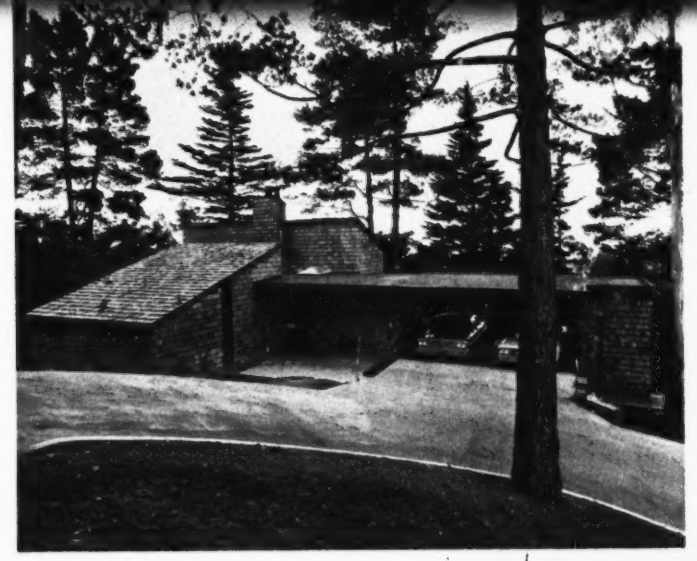
**The tour: what to look for in the architect's work**

The operative word is investigation. This does not mean turning again to the magazines, nor driving by the architect's buildings, nor even walking through them with him and saying periodically, "Isn't that nice!" (If it really isn't very nice, the client's best line is, "Say, this *is* a building.") It means finding out how expeditiously the buildings were built, how much they cost, how well they work and, once again, how they feel as human environment. Advice on procedure would go something like this:

First of all, give the architect a fair shake: let him suggest which of his buildings you should look into. Then steel yourself not to look for the shadow of your building in them. Your building, influenced by your own needs and nature, may turn out to be quite different, even in the hands of this architect.

Next, ask for an advance look at the program for the building you are studying (or a verbal summary if the program does not exist on paper). This way you will have an idea of what the architect was expected to deliver.

Approaching the building, look to see how well it fits into its immediate surrounding, particularly if it is in a key location or a neighborhood whose character demands particular respect. Case the exterior,



weighing your reaction to the use of materials, the general scale, the proportion of one part to another.

Once inside, do the same and also take note of the handling of light, both natural and artificial. (But don't blame the architect for the furnishings without checking who chose them.) Think back to the program and try to form some impression of how well the building fulfills its function. During the tour, don't hesitate to ask the architect about any aspect of the building you find questionable.

Later, arrange to see the building's owner. Tactfully probe further into the building's function; try to determine how the job went; get as much information as you can about costs. If the owner is reluctant to give you specific figures, at least find out how close the final cost was to the architect's estimate. But do not necessarily take all the owner says at face value. If the building came in high, it could have been because he insisted on changes, or simply because building costs in general rose between estimating and bidding.

Finally, if possible, talk to the contractor. Try to find out from him how complete the plans and specifications were, whether they came in on time and generally how the architect performed as construction administrator. But, again, beware. There is a continual cold war of sorts between contractors and architects, so carry an ample supply of salt.

Such a procedure may seem tedious, but nobody said it wouldn't be. The more time and thought the client puts in, the less likely he is to make a mistake in his choice of an architect, the results of which can only be a building that neither looks, feels, nor work well. And that is a terribly prominent, terribly permanent, kind of mistake to make.

# what architects do and how to pay them

Perennial best seller on the publications list of The American Institute of Architects is a document known as B131. It is AIA's Standard Form of Agreement Between Owner and Architect, and it is a masterpiece of compression.

In B131 can be found a comprehensive statement of the architect's basic services, a summary of additional services he is prepared to offer, and a brief list of the owner's responsibilities, plus provisions relating to every eventuality from arbitration to termination and, of course, space to enter the agreed-upon fee. Behind each numbered paragraph, moreover, are decades of custom, tradition and experience (including a good number of lawsuits). B131 can tell the prospective client a great deal about the time-honored way of getting a building built.

But B131 and its companion documents can't tell him everything. Before the client signs on the dotted line, he needs more than a brief and legalistic summary. He needs an understanding — the deeper the better — of what the complex and changing profession of architecture is all about.

**The mysterious architect and his many hats**

There have been few polls about the image of the architect, but those few have produced some interesting results. On the one hand, they show that the prestige of the architectural profession is high; one survey placed it second only to medicine in public esteem. On the other hand, the same polls show that hardly anyone knows exactly what the architect does.

B131 clears up some of the mystery, but its brevity makes the architect's function sound deceptively simple. It breaks his services down into five phases:

**1.** In the first, *schematic design*, he "consults with the owner to ascertain the requirements of the project," prepares schematic design studies and presents a Statement of Probable Construction Cost.

**2.** In the *design development* phase, he prepares design development documents "consisting of drawings and other documents to fix and describe the size and character of the entire project" and submits a further Statement of Probable Construction Cost.

**3.** In the *Construction Documents* phase, the architect prepares the detailed working drawings and specifications upon which the contractor's bids and the actual construction will be based.

**4.** During the *bidding or negotiation* phase, the architect assists the owner in obtaining bids, negotiating proposals, and awarding and preparing construction contracts.

**5.** Finally, in the *construction* phase, administration of the construction contract, he watches the work itself and issues certificates of payment to the contractors as it progresses.

There are several ways to amplify this spare description. One, of which the architect himself is particularly fond, is to point out the varied functions which each phase of his services entails. Thus, at the outset he is an investigator, ferreting out the client's needs, tastes and requirements; then a diagnostician, isolating and defining the building problem. Next he becomes the planner, organizing space, circulation and facilities to meet the owner's requirements, and the creator, seeking to produce an original, evocative and satisfying work of art. From this point on he is also a coordinator, directing the work of multitudes of others from engineers to craftsmen, and an agent, representing the client's interests in the purchase and use of goods and services. During construction he is, to some degree, a policeman, but he is also an arbitrator of disputes between the client and the contractors.

Perhaps the most meaningful way to weigh the architect's services is by their relative complexity and the kind of demands they make on him. In the schematic design phase, much depends on the building type. If it is a hospital, for instance, the architect must sort and interpret a mass of complicated data before pencil touches paper. If it is a church, on the other hand, he will probably begin the process of design much sooner, seeking a form that will express the liturgical principles that are the core of the program.

In the design development phase, the architect must give more detailed attention to matters which are, in themselves, becoming increasingly complex: the structure of the building and the mechanical, electrical and acoustical systems which will have much to do with the pleasantness of the interior spaces. (They will also have much to do with the building's cost: in some cases, these systems account for over half the total.) The store of specialized knowledge in each of these branches of building engineering seems to grow geometrically as the technical papers and reports pile ever higher. The architect can't possibly master it all, but he must be aware of technical advances and understand their potential application to design.

After this, the construction documents phase might seem a simple, if tedious, exercise. Yet the drawings and specifications must convey a precise verbal and graphic statement of the architect's intentions, and their preparation demands a certain creative flair for communications. In choosing materials and equipment, moreover, the architect constantly faces a bewildering array of new alternatives. If the client doubts this, let him take a look at his architect's file cabinet of product literature — and the amount added by any given day's mail.

Before actual construction begins, a contractor must be selected, which is done during the bidding or negotiation phase. The client may extend an invitation to several qualified contractors to bid, or he may negotiate with one contractor, picked with the help of the architect. In any event, the architect assists the client in selecting the contractor and also in preparing construction documents in conjunction with the client's attorney.

Finally there is the construction phase. Its demands on the architect depend largely on the contractors: if they are skilled and receptive, construction can be the exciting climax to all that has gone before; if they are not, it can be hell. In either case, the architect must know nearly as

much about day-to-day procedures as the contractors and care more about craftsmanship than do most workmen in this mass-production age.

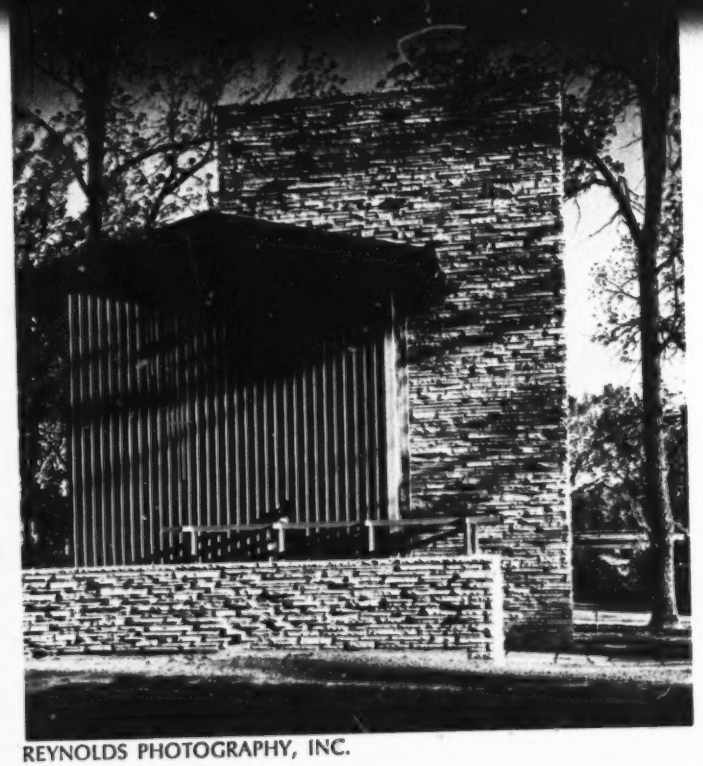
**Portrait of a profession in transition**

The intriguing thing about the architect's services is that they involve so many qualities normally considered to be opposites: creativeness and practicality, imagination and prudence, individuality and group leadership, sensitivity and business acumen. To put it another way, the architect has to be part administrator, part constructor, part engineer, part artist. The administrator is generally pictured as cool-eyed and competent; the constructor as venturesome and extroverted; the engineer as abstracted and introverted; the artist as detached and flamboyant. The pictures don't fit together very easily.

It is at once fascinating and revealing that the architect, with all this to think about, is seriously considering taking on still more. Two forms of expansion of the architect's services are now being discussed: responsibility for the design of larger chunks of the physical environment and/or concern with the extra-design problems of the commercial and industrial client.

Those who wish to take on more of the environment carry the banner of urban design. They feel the architect has been concerned too long with the creation of occasional gems in the slag heap which the uncoordinated, undesigned American urban environment is becoming. It is up to him, they believe, to broaden the application of the architectural process to entire neighborhoods, cities and even regions. What this means to the individual client is that today's architect is likely to show an unexpected interest in the impact which the building will have on its surroundings.

Behind the second kind of expansion is the architect's uncomfortable awareness that a good many of the most powerful influences on building have simply gotten out of his control. Real estate economics, taxation, automation of the industrial process, even public relations, to give but a few examples, often act as significant determinants of design; yet the architect is seldom called in when the key decisions about them are made. The answer that is being offered is the broadening of the architect's competence to provide a whole range of new services — feasibility studies, operational programming, assembly of land and money,



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and a good many others — all under the aegis of professional coordination and counsel.

Perhaps the best rule of thumb for the individual client is that the architect should have some voice in *all* decisions which will importantly influence the eventual shape and function of the building, so that he does not enter the design process with a hand tied behind his back. The question of just how far the architect should go beyond his basic services depends on the nature of the project, how much the architect feels he must do to insure its success and how much the client confidently feels the architect *can* do well.

The essential thing is that the extent of the architect's services be thoroughly talked about in the first architect-client conferences and spelled out in the contract between the two. Equally frank treatment should be given the subject of how much the architect is to be paid; the beginning of a building project is no time to be bashful about discussing money.

**The delicate matter of the architect's fee**

The traditional way to pay an architect for his services is by a set percentage of the project construction cost. The percentage fee has earned its wide acceptance by inherent fairness: what the client pays and what the architect receives are automatically in some kind of proportion to the project's size and complexity. Sadly, however, the percentage fee can sometimes raise as many problems as it solves.

"Everybody considers payments to contractors and suppliers part of the building's cost," said an architect recently with resignation. "The percentage fee sticks the architect's part out in the open, like some kind of optional extra. It's too easy to shoot at." A more dangerous flaw in the system was underlined at a meeting of architects and school administrators a few years ago. In the midst of a perfectly friendly exchange, a high-school superintendent said in his best just-between-us-boys tone, "Of course we all know that architects have to keep costs up to a certain level to come out on their fees." Every architect in the room turned apoplectic, and with good reason. "Hell," said one later, "I did a school for that character once, and I spent half my time knocking down his wild ideas. If he'd had his way, the school would have cost just about twice the budget."

The amount of the percentage depends on a number of variables, notably the project's location, size and complexity. It can range from 3 or 4 percent for a big but simple warehouse to 12 or 15 percent for a small but complicated research laboratory. The across-the-board average (*not* to be used as a guide) has been estimated at between 6 and 8 percent—a good deal less than most contractors allow in their bids for profit and overhead, and about a third of what the auto and aircraft industries invest in product design. Most local AIA chapters have drawn up recommended minimum fee schedules which provide useful guidance. The AIA suggests that architects who do not use these schedules print their own to discourage unprofessional haggling.

The percentage fee is the method of payment covered by AIA Document B131. There are two others used widely enough to have standard forms of their own: the Multiple of Direct Personnel Expense, B231; and the Professional Fee Plus Expenses, B331.

Under the provisions of B231, the architect adds up the salaries of his personnel for the time spent on the project, plus the cost of all consulting services, and multiplies the totals by a mutually agreeable factor to arrive at the fee (AIA suggests the multipliers be not less than 2.5 for personnel, 1.25 for consultants). This method can be especially useful if the scope of the project and the extent of the architect's services are hard to predict, but it requires careful bookkeeping by the architect and constant auditing by the client.

Under the professional fee-plus-expenses-system, the architect himself is paid a separate fee for his personal services, and also paid a multiple of direct personnel expenses and consultants' costs. (The multiple of personnel expenses is generally lower, because the principal's role is taken care of in his personal fee.) The personal fee may be a lump sum, or a lump sum covering some of the architect's own contributions and an hourly rate covering others. The value of this method is that it gives the client freer access to the advice and consultation of the architect than do the others; its disadvantage is that it is the least clear-cut method of paying architects.

There are a few extras. The client is expected to reimburse the architect for such incidental expenses as travel and to pay the bills for site surveys, soil borings and other such reports and tests. B131 also contains a 16-subparagraph list of "additional," though nonexpanded, services — special surveys or analyses of program requirements, alteration of already-approved documents to accommodate last-minute changes — and suggests they be paid for at a multiple of the architect's costs.

B131 also stipulates that payment to the architect begin at the first consultation, with a minimum of 5 percent of the total fee, and continue monthly according to a cumulative schedule: 15 percent to be paid by the end of the schematic design phase, 35 percent to be paid by the end of design development, 75 percent by completion of construction documents, 80 percent by bidding or negotiation phase and the balance by the end of construction.

Initial payments are based on an educated guess of what the building will eventually cost.

Such an educated guess, or even a firm estimate, is invariably one of the first things the client seeks from the architect: how much money for the building or, if the budget has its absolute limits, how much building for the money? About all the architect can tell him is what buildings of a similar size and nature have cost lately in the project's locality. In the design process, the size and nature of the building may change beyond either the architect's or client's wildest imaginings. And by the time drawings and specifications are completed, the "bidding climate" — the relative hunger or satiety of contractors at a given moment — may change drastically. It can, in fact, change overnight, a fact which many architects and clients have discovered to their joint fiscal distress.

**Protecting the interests of both parties**

There is, of course nothing sacred about the standard architect-client agreement forms. AIA itself revises them periodically; they are often modified in one way or another for individual projects; and sometimes they are not used at all. But the basic ground rules established in the standard forms should not be discarded lightly. They have been carefully drawn with the interests of both architect and client in mind, and their wide acceptance speaks well for their fairness and utility.

Some of their provisions may seem at first to be stacked in favor of the architect, but in the end turn out to be justified. For example, the contract states that drawings and specifications remain the property of the architect and cannot be used again without his written permission. It is a minor matter, but the client may feel he has bought and paid for these. The architect's position is that he is rendering a service, not selling drawings, and that the documents are instruments of service, not merchandise. His main purpose is to protect the uniqueness of the building against piracy by a third party.

A more serious source of concern is that the standard form of agreements makes only one reference to time, and that is the provision that the *client* shall render his decisions "promptly, to avoid unreasonable delay in the progress of the architect's work." There is nothing to guard against unreasonable delay on the part of the architect himself.

This does seem rather one-sided, and yet the architect, at the beginning of a project, has as much difficulty guessing how long it will take as he does estimating its final cost. He doesn't really know whether the client knows his own requirements and whether he will be reticent or garrulous in discussing them; whether the job will really turn out to be as fearsomely complicated as it first looks; whether the contractor chosen will be fast or slow, etc. There are some parts of the architectural process that can be kept to a fairly tight schedule, such as production of contract documents, but there are others which it is folly to rush, such as design.

# how to turn a problem into a set of plans

This is a bewildering time in which to build. Technology has given architects the ability to construct just about everything they choose to design, and architects seem to be trying just about everything at once. Behind this explosion of miscellany, moreover, are some differing opinions about the very definition of the term "modern architecture."

To some architects the modern movement means nothing less than a totally new approach to the process of architecture, in which style as such is disregarded and design grows out of an investigation of the problem at hand. To others, modern architecture is itself a style; function is not to be ignored, but the main thing is to give the building a "compelling image."

Most architects stand somewhere in between the two extremes. They stand, to borrow a metaphor from a prominent architectural educator, somewhere in the midst of a diamond. The four corners of the diamond are esthetics (what the building should look and feel like), technology (how it can be built and its interior environment controlled), economics (the limitations of the budget) and function (what the building is to do). Each corner exerts a magnetic force on the architect, and his outlook largely depends on the degree of his response to the tugs of one over the others.

There is nothing in the rules to say that the client can't do a little tugging too, providing he knows what he is about. For the architect's place within the diamond, as we shall see, affects every step of the conceptual construction of the building, from early architect-client conferences, to development of the program, to its interpretation in schematic design, to the fixing of the design in preliminary plans and specifications, to the preparation of the final contract documents.

**The right and wrong ways of tugging an architect**

When the British author and critic Nikolaus Pevsner spoke at an AIA convention, he said that the great ages of architecture have depended as much on knowledgeable clients as on the flowering of architectural genius. "Today," Dr. Pevsner added, "clients tend to be too timid." They "take the architect's vision with rather less checking of the fulfillment of the brief than they ought to do."

Dr. Pevsner's declaration probably came as a surprise to a good many American architects. The giants may be able to treat their clients cavalierly; but some highly competent practitioners, unprotected by reputations for genius, get a good deal of shoving around in this country. For every architect who follows his "vision" to the disadvantage of the building's function, there are others who are pushed by the client into doing things they know are mistakes. "Architecture," said one of the profession's leaders a few years ago, "is 90 percent client control."

The client must strike a rather delicate balance. On the one hand, he cannot let himself be "controlled" to the point where the building becomes no longer his, but solely the architect's. On the other, presuming that he has chosen an architect of some talent, he should not hamstring the talent to the point where he is no longer getting his money's worth in terms of design quality.

One clue to this balance lies in a recognition of what each party brings to the table when architect and client sit down to the process of programming and design. The client, first of all, brings the money to build the building, which is no small contribution. He should put it on the table, at least in the figurative sense, giving the architect a clear and firm idea of exactly what he wants to spend. More than one client has shortchanged himself by cannily setting aside a secret contingency fund and thus imposing a needless limitation on both the architect and the building. Others have wasted their own time and the architect's by talking big at the outset, then spending small when the chips are down.

Nor should this full financial disclosure end with the construction budget. Most design decisions require that a three-way balance be struck among initial cost, eventual cost and the cost of money. A high-priced doorknob may turn out to be a bargain if it will require less maintenance than a low-priced alternative over the life of the building. The savings in maintenance, on the other hand, may be more than offset by the cost to the client of keeping extra money tied up to buy dozens of high-priced doorknobs. The architect can help strike the balance, but only if he knows the client's complete financial picture.

The client also brings an unmatched knowledge of how he likes to run his business. Even though he may not be a reigning expert in his field, he knows better than anyone else what kind of routine, what kind of facilities, suit him best. He should not cling to these old patterns no matter what, but he should describe them thoroughly and defend them staunchly until something demonstrably better comes along.

Finally, business aside, he brings a set of individual tastes and reactions to such things as materials, colors, windows, even doorknobs. Some of his tastes may have to be sacrificed to the success of the building as a whole, but they should be unashamedly expressed and respectfully listened to. The fact that the client may not know much about architecture should not keep him from saying what he likes.

The architect, for his part, brings to the table the entire range of professional skills for which he was chosen, plus a few traits of mind that are especially helpful during the early design stage. He carries a mental catalog of materials, equipment and structural systems which often enables him to make a quick judgment on whether a given idea is promising or impractical. He is also likely to have the ability to take lines and dimensions and intuitively translate them into spaces, predicting with some degree of accuracy how the spaces will look and feel.

Translation of this sort, in fact, is probably going on in the minds of both parties as they begin to discuss the building problem in detail. It is one reason why the concept of the building program — what Dr. Pevsner called the client's "brief" — is currently undergoing considerable change.

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**How to analyze function, measurable and otherwise**
The program's basic purpose, of course, is to define the function of the building in detail. The changes in the programing process reflect an expansion of the concept of function itself. The traditional meaning of function was to accommodate the specific activities which the building must serve. The new concepts of function are no less real, but they are much more difficult to reduce to a numbered list on a sheet of paper.

For the sake of simplicity, take the example of a medium-size regional headquarters for an insurance company. The owner's measurable requirements include clerical lofts, executive offices, salesmen's bullpens, conference rooms and public reception areas — all relatively easy for the client to list and the architect to convert into gross floor areas on the basis of head counts and employment projections.

But the architect is not simply providing working space; he is (or should be) providing a working environment. He needs to know a good deal, therefore, about the company's personnel policies. He needs to know how easy employees are to find, so that he and the company can decide how far to go in providing amenities that make the building itself a fringe benefit. He needs to know, to whatever extent is practical, the tastes and preferences of his invisible clients — those who will use the building — as well as those of the client-owners across the table.

The arrangement and appointments of offices inevitably will proclaim the status of those who occupy them (the programing of a new building thus can touch off a crisis in office politics that makes a Latin-American palace revolt seem mild). The architect has to know a great deal more about the company hierarchy than the organization chart will tell him.

Finally, every aspect of the building will convey a message about the nature of the company. The client and architect should have a clear understanding of what this message is to be. Both must realize that the care with which the building is sited and designed in relation to its surroundings will speak volumes about the company's regard for the community.

An office building is a relatively elementary example of the need for depth and breadth in programing. Other types — hospitals, schools, factories, laboratories — call for a good deal of study before even the measurable requirements can be set down. Progress in health, in education, in industrial processes, in research has been so rapid that the client is almost always forced to make a complete re-examination of past procedures before he fixes future patterns of activity in a new building. It is generally a good idea if the architect is involved in that re-examination.

**The role of the architect as a diagnostician**
The architect, then, has a lot to learn about every new building situation. Each has his own way of going about it. Some firms employ staff experts in their fields of specialization. (One in California, for example, who does a great deal of space-age work, has such nonarchitectural types as aero-dynamicists and inertial guidance engineers on its permanent payroll.) Some make a practice of wholesale interrogation of everyone in an organization, from shipping clerks to chairman of the board. Some are looking into the use of computers to sort the mass of program data involved in large, complicated projects.

A growing number of architects are actually taking over the job of writing the program, completely reversing the old order of things. A Texas architect who likes to work this way calls the program the "architectural diagnosis." What self-respecting doctor, he asks, would prescribe a remedy on the basis of what the patient thinks he needs, without making his own professional examination?

The diagnostic approach, which normally requires some adjustment of the basic fee schedule, effectively blurs the line between programing and design. Any broadening of the architect's involvement in programing, in fact, raises the question of whether such a line really exists.

Every time the range of problems is narrowed down by the architect or client, a design decision has been made. Whether pencil touches drawing paper, an act of design occurs whenever one problem is recognized as significant or another is set aside as irrelevant. An eastern architectural dean stated the point somewhat more poetically at an AIA convention. "The artist always ignores certain problems, addressing himself to a selected few," he said. "He proceeds to solve these so eloquently

that everyone understands the statement and its truly glorious solution."

The client had better realize that all of this is going on as he and the architect confer. He needs to be conscious of the influence which even the earliest decisions will have on the eventual shape, the eventual utility, and not least, the eventual cost of the building. Otherwise, he may be in for a shock when the architect walks in with the first drawings.

It is a difficult moment at best. The client has poured forth his wants and needs, the architect has probed and mulled, they have reached verbal agreement on a general approach — and suddenly there it is, as specific as black lines on white paper (or even in the more specific form of a study model). Sometimes, of course, the client sees on the paper exactly what he wanted, interpreted with more artistry than he could have imagined. But more often, the client looks at the drawings with a great deal of uncertainty and perhaps a tinge of panic. Is *this* what he and the architect have been talking about? Will he really like it when it's built?

At this point, recollection of a few simple points may help to ease the panic:

**1.** These are the first, not the final, drawings. They are simply an intermediate step in the continuing process of design.

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**2.** This is a general scheme for the shape and arrangement of the building, not a complete design. The client should avoid getting caught up in details that immediately catch (or repel) his eye.

**3.** This is no time to be bashful. It is the client's turn to be the interrogator, to ask the architect the whys and wherefores of every aspect of the design which troubles him. Questions are best resolved now before changes become expensive. This is a bad time to hurry things. For once the schematic design is approved, the economic and technological corners of the architectural diamond assume increasing importance.

**Preliminary plans and "probable statements"**

The architect already will have checked the feasibility of the overall scheme with his engineers, but now they must get down to the complicated details of how the building and its services are to be put together. Some general decisions will have been made about materials and equipment, but now the time has arrived for specific choices of major items. Dimensions are hardened, rough edges smoothed down, and the architect goes back to the client, this time carrying preliminary plans and outline specifications.

The ground rules call for the architect to submit a Statement of Probable Construction Cost with the schematic design studies, but it is necessarily general in nature. In the process of schematic design, price tags are put on all major elements of the building, and some have to be modified or taken out altogether to meet the budget. The second estimate which accompanies the schematics gives the client a fairly clear idea of what he is getting for his money. But it is still only "probable." Any number of small changes (adding up to big money) can occur during production of the final drawings and specifications, and no one can accurately predict what the competitive state of the building business will be when bids are taken.

The chances of both client and architect getting through the bidding process without trauma are in direct proportion to the time and care they have put into the process of programing and design. In these days of steadily rising construction costs, the client's best defense against budgetary disaster is a continuous, painstaking analysis of every element of the building. Every possible alternative must be explored if the client is to get the most out of his steadily dwindling construction dollar.

Paradoxically, this requires that the client spend money in order to save money. The spending part comes in design fees. If the client is to get the most out of the architect's analytical ability, he must be willing to pay a fee adequate to cover the amount of programing and design study which the problem demands. (It must also be adequate to cover a more-than-routine analysis by the architect's engineer consultants, whose work determines how so much of the construction dollar will be spent.) The savings in building costs will almost always be a healthy multiple of whatever extra time and money is invested in the preliminary stages.

# how to go from concept to construction

By the time preliminary plans for his building are completed, the client has an imposing array of talent at his disposal. There are the architect and those members of his office staff assigned to the building. There are the structural, mechanical and electrical engineers who are normally paid out of the architect's fees (and can easily account for a third or more of it). There may be any number of other consultants, at extra fees, called in for advice on everything from colors to elevators to the interior design of entire floors.

Finally, as the project moves from conception to execution, the largest group of all prepares to join this legion: the contractors who will do the buying of materials and equipment and the building tradesmen who will do the actual work of construction. While the consultants have been in on the countless decisions that gave shape to the building concept and have a clear idea of what the end product is intended to be, the contractors and workmen can only know what the client and architects tell them about the project.

One essential step remains, therefore, before they can begin their work: preparation of the architect's working drawings and specifications, which must describe the building until the real thing rises from the site.

**Plans, sections, elevations, and divine details**

"In general," says the *Architect's Handbook of Professional Practice*, "information relative to design, location and dimensions of the elements of a project is the province of working drawings; and that having to do with quality of materials and workmanship belongs in the specifications." To state it another way, what can best be shown is put in the drawings, and what can best be told, in the specifications.

The drawings, when reproduced, are often called the "blueprints" for the building, although these days prints also come in other colors. They include plans; elevations, showing the walls head-on; sections, slicing the building open at various points; and details. There are also "schedules" of finish materials, doors, windows and hardware, showing how much of each item goes into every part of the building. Along with the general drawings of the shell go separate sets for the structural frame and the heating, air conditioning, plumbing and electrical systems.

Their production involves a challenge in communications between the architect and his consultants, most of whom are charged with production of working drawings of the building elements in their charge. It is up to the architect to see that, in the end, they come out even: that every time a part of the building is shown it looks the same and that the elements in one set of drawings dovetail with those shown in another. Otherwise, to use an example that is not totally unheard of, the contractor may find that he is asked to put a heating duct and a beam in precisely the same place.

For all their communications aspects, the drawings are also acts of design. It is at this point that the details of the building, the places at which its various parts are joined together, are worked out, and in the current era of simplicity of surface, details are all important. The famous assertion by an architect that "God is in the details" may be dubious theology, but it underscores the loving care which today's architects put into them.

**The delicate art of the specifications writer**

The writing of specifications is no less an art than the making of working drawings, but it is perhaps in a somewhat earlier stage of development. The drawings, to recapitulate, show *what* goes *where* in the building. The specifications define the "what" and provide precise instructions for putting every item in place. Their principal concern is quality: they must state the standards to be enforced for each item used in the building and also for all important phases of the work itself.

The specifications writer, then, is in part a purchasing agent for the project, providing a shopping list covering each item and every building component. He is also something of a judge, attempting to anticipate and settle in advance potential conflicts among contractors, suppliers and the jealous principalities of the building trades.

**The need for accuracy and completeness**

The volumes produced by these specialized authors generally have as their foreword the basic ground rules for contractors. These include the bid invitations and instructions, the bid and contract forms, the bond requirements and the all-important General Conditions of the Contract. The bulk of the specifications is organized according to trades, and the sequence of trades is determined by the order in which they perform their jobs.

The trade sections of the specifications begin with a statement of the scope of the particular trade's work. It must make clear exactly where the jurisdiction of one trade ends and the other begins.

Next come a list of the materials and equipment required for the work at hand; provisions for any shop drawings or samples required to be approved by the architect and client before these items can be installed; procedures to be followed in construction of all elements of the building for which the trade is responsible; stipulation of any tests to be made of the work; instructions for cleaning up after the trade is finished; and, finally, the guarantees which will be asked of the contractor.

All of this may sound quite dry and technical, yet in a real sense the trade sections of the specifications tell the history of the American building industry. It is here, for example, that new and revolutionary methods that will change the course of the industry are often first recorded, for most building research is promoted by individual projects. It is here that new products and materials undergo the acid test. It is here, too, that anachronistic methods of building are preserved and codified because the specifier knows that more progressive ways would meet resistance from building officials or unions or convention-bound contrac-

tors. And it is here that jurisdictional judgments are recorded which, by assigning work to one trade over another, can in the long run bring prosperity to the chosen group of contractors and craftsmen and eventual extinction to those excluded.

It is understandable, then, that the specifications are never prepared in a vacuum. While they are in preparation, the architect is beset with pressures, the vast majority of them perfectly legitimate. Fortunately for the client, sharing these pressures — knowing which suggestions and appeals to accept and which to reject — is part of the architect's job.

Some of the pressures come from salesmen of building products and materials, whose relationship to the architect and client is something like that of the lobbyist to the legislator: the salesman is a special pleader, but he can also provide useful information. The salesman's goal is to get his product specified by brand name; failing that, he wants to be sure the architect does not name another brand to the exclusion of his. The architect's goal is to be sure he has considered all reasonable alternatives in his role as the client's purchasing agent.

It used to be that the specifications would be full of brand names followed by the term "or equal," but the trend is toward *performance* specifications — which, however, are tricky to prepare. Even though some trade associations and independent testing organizations have developed helpful standards for many large and basic items, it still takes great skill to apply these standards to the particular situation at hand.

Pressures also come from the contractors, once they get a look at the plans and specifications. They may have favorite products and materials, favorite ways of doing things, at variance with what the architect has prescribed; they may have had a bad experience with an item in the specifications; they may be reluctant to experiment with new building materials.

Architects, except for those few who assume omniscience, will give their suggestions careful consideration. Indeed, they often call in one or more contractors for advice while the drawings and specifications are still being prepared. There is no substitute for the know-how that comes from direct experience in construction, a fact which places special importance on the care with which the contractor is selected.

**Competition, negotiations, segregation—and money**

When public monies are involved, there is a tidy division between the completion of drawings and specifications and the choice of a contractor. The contract documents are prepared, a public notice is issued inviting responsible builders to submit their bids, and the one turning in the lowest figure gets the job.

The system of open competitive bidding is a traditional part of the romance of construction. It is free enterprise at its freest and most frantic form. It virtually assures the client of getting the lowest available price tag on his building. It also has a great deal to do with the fact that Dun & Bradstreet reports a ratio of net profit (on sales) of only 1.18 per cent among building contractors.

If wide-open bidding is a perilous gamble for many contractors, it also has its chancy aspects for client and architect. The lowest bid is seldom the most realistic one, and a builder in danger of losing his shirt can find room for costly extras in even the most tightly drawn contract documents. More important, it makes price the prime basis of selection, eliminating the opportunity to weigh the contending contractor's comparative abilities to turn out quality work.

Two alternative methods are open to the private client. He can retain the benefits of competition but limit the contenders to a select list; or he can simply negotiate a mutually agreeable price with a chosen contractor.

The common element of these two methods, of course, is the screening of contractors in advance. Sometimes this simply means taking the architect's word that he has worked with a given builder and has found him capable and reliable. In other cases, however, it means looking into the success of the contractor's past projects, the size and length of service of his work force, his reputation as an administrator of construction and even the kind of equipment in his corporation yard.

The negotiated contract has the considerable advantage of allowing the builder to become a valuable collaborator in the final stages of design. Obviously, however, he must be a man well known

and thoroughly trusted by both client and architect. If no such man comes to mind and the client opens the project to bids, the use of a quantity surveyor can help to put the bids on a more realistic basis (and also provide a preview of the eventual cost of the building while it is still possible to make changes). The quantity surveyor estimates the amounts of materials required for the building and sometimes the total man-hours of labor, putting a price tag on each. This extra service is the rule in England and becoming more popular in the U. S.

Another form of protection for the client who chooses to invite bids takes the form of deposits and bonds. Each contending contractor is required to submit a deposit with his bid. If he is the low bidder and for some reason decides to pull out, the client gets the deposit. The amount is usually a lump sum determined by the architect on the basis of his estimate of the project's cost or, less frequently, a percentage of the bid. The successful bidder also is required to put up a performance bond, insuring that the work will be finished even if he goes out of business, and often a labor and material bond guaranteeing payment of suppliers and subcontractors.

The contractor has been referred to in the singular, but, in actual fact, there are two basic ways to undertake construction: to engage a single general contractor who will subcontract whatever work his own force does not do or to engage separate contractors for each major segment of construction. The latter practice, sometimes called segregated bidding, usually involves the letting of individual contracts for the shell of the building and for its mechanical and/or electrical services.

**The controversial role of the general contractor**

The relative merits of the two systems are the subject of continuing controversy within the construction industry. The general contractors claim that they are in the best position to captain the job from start to finish and point to the advantages of having a single coordinator responsible for the entire project. The specialty contractors claim that this procedure no longer makes much sense in an era when mechanical and electrical systems account for an increasingly large part of the cost of buildings; they say it simply puts a superfluous middleman in the way of progress.

The decision between letting one or several contracts is usually determined by each specific building situation: the nature of the project and the customs of the local construction industry. If segregated or separate bids are taken, however, the client should be prepared to pay the architect an additional fee for the close coordination that

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would normally be the task of the general contractor. And regardless of which system is used, the client and architect should exercise the same care in screening specialty contractors as they do in the selection of the general contractor.

The final decision to be made in choice of contractors returns the client to the familiar subject of money. Bids can be requested in the form of a lump sum, or the contractor can simply undertake the work on the basis of actual cost plus a negotiated fee. The first system is simpler and more clear cut, but can tempt the contractor to shave corners if he begins to realize he has submitted a disastrously low figure. The second puts the contractor on a more professional basis, but does not offer as great an incentive toward economy. Sometimes a combination of the two is used in which the contractor agrees to a cost-plus-fee arrangement, with a guarantee that the total will not exceed a stipulated "upset price." Savings are split between client and contractor on a predetermined scale.

With such decisions made, the time has again come for the client to sign his name. Earlier, he contracted with the architect for a concept and a service, the net result of which was, to this point, a stack of paper. Now he is contracting for equipment, for materials and for labor. The net result this time will be his building.

# how to turn a set of drawings into a building

Construction can be — and sometimes actually is — the happy climax to the entire lengthy process of creating a building. Construction also can be a nightmare of disappointment and discord, negating all the work that has gone before.

Whether construction is a climax or a nightmare will be determined, in part, by the client's earlier decisions and the architect's earlier labors: the care taken in the selection of the architect himself, of the consultants and of the contractors; the realism of the design; and the precision with which the design has been reduced to plans and specifications.

And it will also be determined by the client's actions during the construction period ahead. The start of construction means changes in the relationship between client and architect, and it also means establishing new relationships — with contractors and building tradesmen. The client must know when to spend and when to save, when to authorize changes and when to stand pat and, above all, when to take a hand in the building process and when to retreat behind the terms of the construction contract.

Experience is by far the best teacher in all these things. The only advice to be offered the first-time client, as construction begins, is 1) to keep his eyes wide open, and 2) to go by the book, insofar as possible. The trouble is that even the book is unclear on certain significant matters.

**The architect administers, the contractor supervises**

The basic ground rules for the construction process can be found in the previously cited Handbook, and in the so-called general conditions (Document A201) of AIA's Standard Form of Agreement Between the Owner and Contractor. Together, they form the closest thing to a common law for the building industry, codifying both tradition and practice.

One of the significant matters which they leave a bit muddy is what the architect himself does while construction is underway. They are quite specific about a number of his functions, spelling out what he is to do about change orders, shop drawings, certificates of payment and other essentials. But the lack of clarity concerns the most crucial task of all, which is seeing that the building is built exactly as it was designed.

"In administering the construction contract," says Chapter 18 of the Handbook, "the architect determines in general if the contractor's work conforms with the contract documents." But then it goes on in the very next sentence, "The architect is not responsible for the contractor's failure to execute the work in accordance with the contract documents."

This seeming ambiguity represents an attempt by the architectural profession to establish a distinction so fine that it would do justice to a medieval philosopher — out of the justifiable motives of client service and self-defense.

The architect's role in construction used to be described as "supervision" or "superintendence." The abandonment of these terms by AIA came in response to a series of court decisions in which the architect's construction responsibilities in the eyes of the law were steadily, and somewhat frighteningly, broadened. Individual architects were held liable for mistakes that were clearly the fault of contractors, subcontractors and others; it began to seem that the architect could be sued if a deliveryman tripped and broke his leg while bringing coffee and doughnuts to the carpenters.

The easy way out, of course, would have been for architects to disclaim any further concern with the contractors' work — after all, it is the builder, not the architect, who contracts to see that everything turns out as intended. But this would be an unacceptable abridgement of architectural services. For one thing, few conscientious architects want to give up some measure of control over the execution of their designs, except in unusual circumstances. For another, the concept of the architect as the client's independent agent, protecting the client's interests during the building process, is one of the profession's best counter arguments to the sales pitches of the package design and construction services.

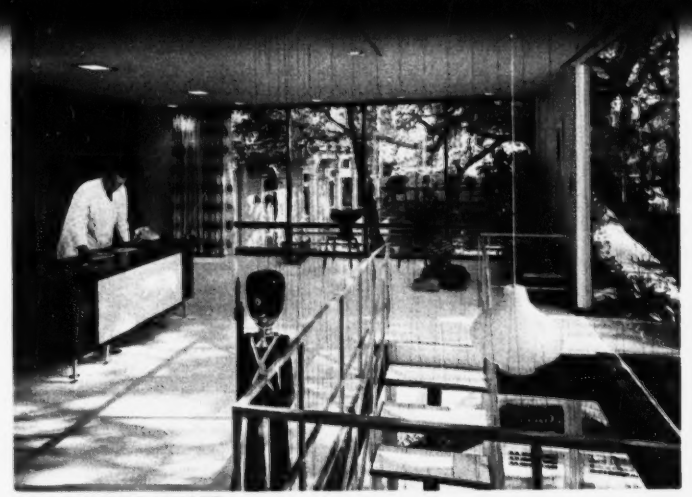
Hence AIA's recourse to semantics, intended as a restatement rather than a change in the ways things always have been done. The term "construction superintendence" is donated to the contractor; it is he, says the Handbook, who is responsible "for delivering to the owner a project in full conformance with the contract documents." And it is the contractor who also has the duty of "management of the construction process."

Managing construction is much like managing any enterprise involving the production of goods. It entails such everyday managerial functions as the purchase and assembly of materials and components, the handling of personnel and the coordination of a complex process according to a stated schedule of delivery. Not surprisingly, contractors have turned more and more to the methods of business and industry for management tools, from bar charts to the computerized critical path method of keeping the job going.

To maintain the analogy, the architect's relationship to the contractor is something like that of a member of the board of directors to the chief operating executive. The revised Handbook calls it "construction contract administration," a term which covers a multitude of functions.

The architect, to begin with, is the prime interpreter of the working drawings and specifications, establishing and maintaining the standards which the work must meet. He is the judge of whether these documents and standards are being followed, checking shop drawings of building components, approving samples of materials and equipment, and authorizing any necessary changes in the work. And he is the one who certifies progress payments to the contractor as the work proceeds.

He does these things by making "periodic" visits to the site, explains the Handbook, introducing another unavoidable ambiguity. The meaning of "periodic" has to be worked out jointly by the client and architect on the basis of the particular situation at hand. Under a normal fee arrangement, on a normal size building and with a normal lump-sum contract, it does not mean that the architect will camp at the job full time. Instead,



FRANK LOTZ MILLER

he, his representative (often the same staff member who has seen the building through drawings and specifications), or one of his consultants will try to be there at all crucial stages of the work.

There are many cases, however, in which full-time "administration" is indeed a necessity. If the project is large and complex, one or several full-time project representatives may be required. If it is awarded on a cost-plus basis, there must be continual auditing of man-hours expended and materials purchased. The client has the option of paying the architect extra for these extra services or hiring his own project representative to keep an eye on things. The use of a project representative — formerly poetically called the clerk of the works — can pay off handsomely, but he must be chosen with care and should, in all cases, report to the architect. Otherwise, the client is only adding another strand to the already complicated web created by the various lines of authority over the job.

**Lines of authority, from the client to the workmen**

These lines of authority, somewhat paralleling the responsibilities outlined here, are spelled out in the General Conditions of the Contract, which place the client in the catbird seat. His responsibilities are few, although rather important — he provides the site and pays the bills — and his authority is ultimate.

The tricky part of the client's job is the delegation of this authority to the architect and contractor. It is the client's money and the client's building, but he must rely almost entirely on his chosen agent (architect) and project manager (contractor) to see the job through. If he takes a personal hand in things, moreover, he can lose some of the construction contract's safeguards and guarantees — he, not the architect or contractor, can become responsible for defects in any part of the work he has directed. The client, however, still has an ace in the hole: he can fire the architect any time, and he can dismiss the contractor for a variety of reasons, including tardiness or incompetence.

The authority wielded by the architect (or those reporting to him) is the delegated authority of the client. He can order the contractor to speed things up, to return substandard materials or building components, even to tear whole sections of the building out and start over, all in the client's name.

He is far from autonomous, however. He has a voice in the general procedures and even equipment which the contractor proposes to use on the project, but within these limits it is up to the contractor to manage things the way he thinks best. If the architect interferes unduly, he can unwittingly take on some of the contractor's legal responsibilities. And the client can, at any time, pull the rug of authority out from under the architect's feet. Some contractors (and even suppliers) are highly skilled at circumventing the architect and establishing a direct relationship with the client. Once this happens — and if the contractor turns out to be unscrupulous — the client is at his mercy, with no one to blame but himself.

The contractor has authority over the subcontractors (except when a segregated or separate contract is used) and over the workmen (within the sometimes narrow provisions of their union agreements). Otherwise, as one author of a contracting textbook has put it, he has "few rights and many obligations." He is responsible for completing the project on time, within the contract price, and, as previously noted, in accordance with the plans and specifications. Even if these documents are incomplete, or are incorrectly interpreted by the architect, the contractor can be stuck if something should go wrong unless he registers a protest in writing during construction. He also has prime responsibility for safety on the job. If he has submitted a lump-sum bid, he must exercise these obligations come hell or high water. Small wonder that the cost-plus system is gaining in popularity among the contracting profession.

Even going by the book, then, the distribution of responsibility, liability and authority during construction is a delicate balance. In practice, the human factor is all-important. More often than not, it alone is what makes the balance work.

**Sore spots: craftsmanship, changes and the calendar**

Were it not for the fact that client, architect and contractor normally share a desire to see the job done well, very few buildings would ever reach completion. For there comes a time on every job when problems arise that could pit one against the other, and then "the book" is of very little help.

One area in which such problems frequently come up is quality of workmanship. The specifications are supposed to set the standards to be enforced on the job, but the specifications can only go so far — they would be endless if taken to the last fine point. Also, there are some standards that neither words nor drawings can convey with precision. Specification of a certain texture in an exposed concrete wall, for example, may bring quite a different picture to the minds of the workmen than was in the mind of the architect.

Another sore spot can be the matter of changes and extra work. The source may be the drawings and specifications themselves; the building process is bound to reveal gaps in even the most tightly drawn set of plans. Or it may be the architect, who finds that a detail that looked so masterful on paper looks crude and clumsy in place. Or it may be the client, who suddenly blurts out a long-

suppressed feeling that he has always hated one kind of paneling and would like another type instead.

A third creator of crisis can be the calendar. The job is going swimmingly, and then comes a strike, a shortage of materials, a long spell of rain or a virus that runs rampant through the building trades. The client has made all sorts of plans — and established his budget — on the basis of a schedule which (he thought) allowed plenty of time for contingencies. The contractor has agreed to meet the schedule. But now the entire project has bogged down, and there is no telling when it will get going again.

Enter the human factor. The architect, when he finds sloppy workmanship, can rant against the decline of the building crafts, demand that the whole thing be done over and hint darkly that he intends to blacken the name of the contractor unless the level of quality improves. The contractor, when he finds holes in the drawings or is asked to make a minor change, can tell the client that he expects to be paid for every extra minute his men spend on the job and pointedly ask why the client didn't get a more realistic architect. The client, when he finds the job falling behind schedule, can squeeze the last penny in penalties out of the contractor, even if it drives the contractor close to bankruptcy.

The result of such behavior — in each instance perfectly justified by the terms of the contract — is to make big problems out of little ones and, quite possibly, to bring the whole project to a temporary halt. Fortunately, very few architects and contractors act that way, and the wise client emulates the restraint of the majority. His most effective safeguard is not a bond or the authority to withhold payment or any such device; it is the desire of most building professionals to do good work and to maintain reputations it has taken years to build.

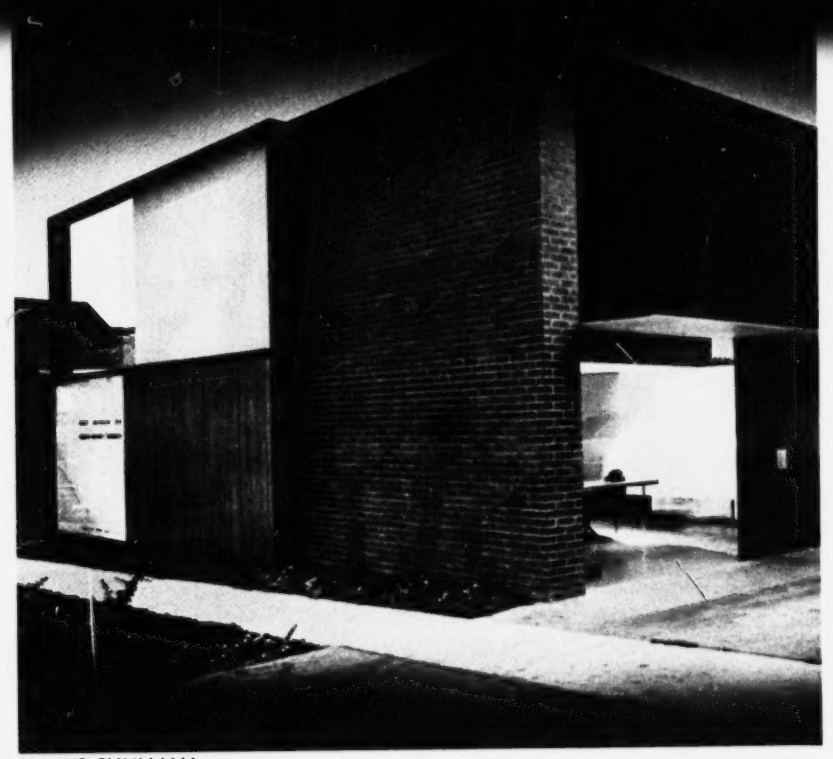
Once in a while, however, a major crisis is allowed to develop, and then it is time for arbitration. When the dispute is between client and contractor, it is the architect who is the arbitrator. This is the major difference between the architect-client relationship at this and at earlier stages. The architect is still the client's agent, but when the client and contractor disagree, the architect is expected to render an impartial, professional judgment.

Should the disagreement be a serious one, or should the architect himself be involved, it is common practice to resort to a more formal sort of arbitration. AIA follows the Construction Industry Arbitration Rules of the American Arbitration Association. Normally, a three-man board is appointed, whose members are familiar with construction practices, and this board decides the dispute after a full hearing of both sides. The most significant advantage of arbitration is that work can proceed pending the decision. Further information can be obtained from the American Arbitration Association, 140 W. 51st St., N.Y., N.Y. 10020.

**What to do before sending for the moving van**

At some point during the latter stages of construction, the client is likely to wonder if the process will ever end. The shell of the building went up fast enough, but now the finish work seems to be dragging on interminably. Then he gets a call from the contractor: his men should be through in about ten days; the client can begin to make his moving plans.

Thus begins the ritual of closing out the project. The architect makes one last inspection, more searching than any that have gone before. If he finds deficiencies, they must be corrected; if not, he recommends to the owner that the contractor be paid in full and the building accepted. Sometimes, when the owner is in a hurry to move in, he accepts the building as "substantially completed," meaning that it is ready for use even though some work may remain to be done.



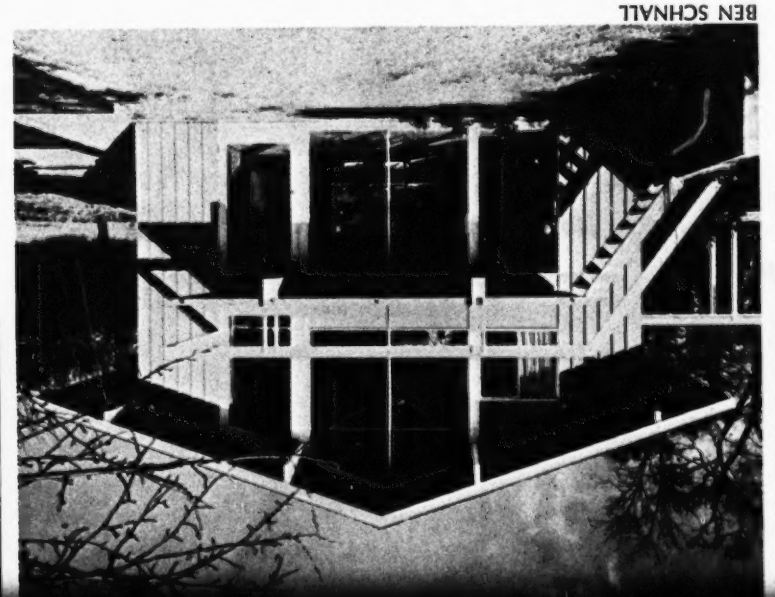
JULIUS SHULMAN

The amount owing the contractor on acceptance is the last of the progress payments plus the so-called "retained percentage." This is the amount which the client will have held back from earlier payments to the contractor; usually it runs between 5 and 20 percent of the total. The retainage is a form of insurance that the contractor will not leave the job until the client and his architect-agent are fully satisfied.

Before the contractor gets his money, he is asked for a release absolving the owner from liens or claims from subcontractors, suppliers or others. Otherwise, the owner might find his building attached six months hence because of a bill the contractor neglected to pay. If any liens or claims are outstanding when the building is accepted by the owner, they are deducted from the contractor's final payment. The owner also receives a warranty from the contractor for a set period of time, usually a year, after acceptance. Should the roof leak or the walls develop cracks during that time, the contract requires that the builder come back and fix things up.

The client, as careful readers will note, has just become the owner. The building is now, for the first time, entirely his. Next time he becomes a client again, he will be a wiser one, but next time may bring a new set of problems. For building is never easy, but neither is it ever dull.

BEN SCHNALL



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